

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference G/2AD43/CS/6	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/NL 03/00183	International filing date (day/month/year) 11.03.2003	Priority date (day/month/year) 11.03.2002
International Patent Classification (IPC) or both national classification and IPC F24F12/00		
Applicant LEVEL ENERGIETECHNIEK B.V. HOLDING B.V.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
 - This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.
3. This report contains indications relating to the following items:
 - I Basis of the opinion
 - II Priority
 - III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV Lack of unity of invention
 - V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI Certain documents cited
 - VII Certain defects in the international application
 - VIII Certain observations on the international application

Date of submission of the demand 15.09.2003	Date of completion of this report 19.07.2004
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**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No.

PCT/NL 03/00183

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-12 as published

Claims, Numbers

2-13 as published
1 received on 24.05.2004 with letter of 24.05.2004

Drawings, Sheets

1/6-6/6 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1
	No: Claims	
Inventive step (IS)	Yes: Claims	1
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1
	No: Claims	

2. Citations and explanations

see separate sheet

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- 1) Reference is made to the following document introduced by the examining division during the telephone conversation on 13 May 2004 with the applicant:

D2: US-4,391,321

2) The amendments filed with the International Bureau under Article 19(1) introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 19(2) PCT. The amendments concern the passage in claim 1 reading "**wherein the ducts of both groups extend mutually parallel**" which substitutes the originally filed formulation "**which group is thermally coupled to the first group of ducts**". The examining division has disregarded the amendments during the examination.

3) In light of document D2 and the documents cited in the international search report, it is considered that the subject-matter of claim 1 appears to meet the criteria mentioned in Article 33(1) PCT, i.e. appears to be novel and inventive.

4) **Novelty**

Document D2, which is considered to represent the most relevant state of the art, discloses (cf. figures 1 and 2) a:

Recuperator for transferring thermal energy from a warm gas flow to a cold gas flow, comprising:

- a first group of ducts with a first connection and a second connection;
- a second group of ducts with a third connection and a fourth connection, which group is thermally coupled to the first group of ducts;
- first supply means for supplying the cold gas flow to the first connection;
- first discharge means for discharging the cold gas flow from the second connection;
- second supply means for supplying the warm gas flow to the third connection; and
- second discharge means for discharging the warm gas flow from the fourth connection,

wherein the device comprises a first alternating valve (33, column 4, lines) for temporarily and repeatedly alternately connecting:

- the first supply means to the fourth connection;

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- the second discharge means to the first connection; and
- control means for repeatedly changing the connections (column 1, lines 65
-68),
from which the subject-matter of claim 1 differs in that the device comprises a
second alternating valve for temporarily and repeatedly alternatingly connecting:
- the first discharge means to the third connection;
- the second supply means to the second connection.

The subject-matter of claim 1 is therefore novel (Article 33(2) PCT).

5) Inventive Step

The reversion of the function of the first group of ducts and the second group of
ducts (in order to avoid condensation and possible ice formation inside the
recuperator) in the device known from document D1 causes the first discharge
means and the second supply means to interchange their mutual positions. The
problem to be solved by the present invention may therefore be construed as
maintaining the position of the first discharge means and the second supply
means regardless of the function of the ducts. By adding a second alternating
valve to the recuperator, the first discharge means and the second supply means
can be connected to either the second or the third connection. Hence, when the
function of the first group of ducts and the second group of ducts is reversed, the
first discharge means and the second supply means do not change their positions.

Such a solution has neither been suggested, nor rendered obvious by the
available prior art. The subject-matter of claim 1 does therefore involve an
inventive step (Article 33(3) PCT).

**6) The attention of the applicant is furthermore drawn to the following deficiencies
appearing in the application:**

- 6.1) Although claim 1 is drafted in the two-part form the feature "***control means for
repeatedly changing the connections***" is incorrectly placed in the charac-
terising portion, as it is disclosed in document D2 (Rule 6.3(b) PCT).
- 6.2) The features of the claims are not provided with reference signs placed in
parentheses (Rule 6.2(b) PCT).
- 6.3) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art
disclosed in the document D2 is not mentioned in the description, nor is this

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document identified therein.

- 6.4) The description is not in conformity with the claims as required by Rule 5.1(a)(iii) PCT.

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(55) PCT/NL03/00183

NEW MAIN CLAIM

5 1. Heat exchanger for transferring thermal energy from a
warm gas flow to a cold gas flow, comprising:
 - a first group of ducts with a first connection and a
second connection;
 - a second group of ducts with a third connection and a
10 fourth connection, which group is thermally coupled to the
first group of ducts;
 - first supply means for supplying the cold gas flow to
the first connection;
 - first discharge means for discharging the cold gas flow
15 from the second connection;
 - second supply means for supplying the warm gas flow to
the third connection; and
 - second discharge means for discharging the warm gas
flow from the fourth connection,
20 - wherein the device comprises alternating means for
temporarily and repeatedly alternating the supply means on
the connections,
 characterized in that the alternating means are adapted
to temporarily and repeatedly alternating the discharge means
25 on the connections.

New claim 1 PCT/NL03/00183 filed with letter dated 24.05.2004

Claims

1. Recuperator for transferring thermal energy from a warm gas flow to a cold gas flow, comprising:
 - 5 - a first group of ducts (2) with a first connection and a second connection;
 - a second group of ducts (3) with a third connection and a fourth connection, wherein the ducts of both groups extend mutually parallel;
 - first supply means (6) for supplying the cold gas flow to the first connection;
 - first discharge means (7) for discharging the cold gas flow from the second connection;
 - 10 - second supply means (8) for supplying the warm gas flow to the third connection; and
 - second discharge means (9) for discharging the warm gas flow from the fourth connection,
- wherein the device comprises alternating means (10,11) for temporarily and repeatedly connecting:
 - 15 - the first supply means (6) to the fourth connection;
 - the first discharge means (7) to the third connection;
 - the second discharge means (8) to the second connection ; and
 - the second discharge means (9) to the first connection,
- 20 characterized in that the alternating means comprise two alternating valves (10,11) located at opposite sides of the combination of the first and second group of ducts (2;3) and control means for repeatedly changing the connections.